

Amendments to the Claims

This listing of claims will replace all prior versions and listing of claims in this application.

Listing of claims:

Claims 1-18 (Cancelled)

19. (Currently Amended) A process for producing a catalyst for olefin cracking, the processing comprising the steps of:

providing an MFI-type crystalline silicate catalyst with a crystalline silicate framework;
formulating said MFI type crystalline silicate catalyst with a binder comprising silica to produce a formulated catalyst;
heating the formulated catalyst in steam to remove aluminum from the crystalline silicate framework;

~~and extracting aluminum from the formulated catalyst by contacting the catalyst with a complexing agent for aluminum to remove aluminum from pores of the framework aluminum deposited therein during the steaming step, thereby to increase the silicon/aluminum atomic ratio of the catalyst;~~

~~and calcining the formulated catalyst at an elevated temperature; and~~
~~formulating said MFI type crystalline silicate catalyst with a binder comprising silica to produce catalyst particles in a formulation of said MFI type crystalline silicate and silica binder wherein said MFI crystalline silicate catalyst is formulated with said silica binder to produce said catalyst particles prior to heating said catalyst in steam to remove aluminum from the crystalline silicate catalyst framework and extracting aluminum from the pores of the catalyst framework.~~

wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and extraction of aluminum had a silicon/aluminum atomic ratio of at least 120.

20. **(Currently Amended)** The process of claim 19 wherein said silica binder is employed in an amount to provide a ~~catalyst particles of said silica binder and said MFI type crystalline silicate catalyst~~ containing at least 20% ~~silica, and where steaming and extraction occurs before binding.~~

21. **(Currently Amended)** The process of claim ~~20~~ 19 wherein said silica binder is present in an amount of about 50 wt.%, and where steaming and extraction occurs after binding.

22. **(Cancelled)**

23. **(Currently Amended)** A process for producing an olefin cracking catalyst to produce ethylene and polypropylene from C₄ to C₁₀ olefins comprising:

(a) ~~providing an MFI type crystalline silicate catalyst~~ containing aluminum and silicon in ~~the a crystalline silicate catalyst~~ framework to provide an initial silicon/aluminum atomic ratio;

(b) ~~formulating said crystalline silicate catalyst~~ with a silica binder to produce a formulated MFI type catalyst particles containing said MFI type crystalline silicate catalyst and the silica binder;

(c) ~~subsequent to the formation of said formulated MFI type crystalline silicate-binder catalyst particles, subjecting said catalyst particles to steaming to remove aluminum from the framework of the crystalline silicate catalyst;~~

(d) ~~thereafter dealuminating said catalyst by treating said formulated catalyst particles with a complexing agent for aluminum to remove aluminum by extraction from the pores of said~~

catalyst deposited therein during the steaming step, thereby and provideing a silicon/aluminum atomic ratio greater than said initial silicon/aluminum atomic ratio; and

(e) calcining said catalyst ~~partieles~~ at an elevated temperature; and

(f) wherein said catalyst is used to produce ethylene and polypropylene from C₄ to C₁₀ olefins.

24. **(Currently Amended)** The process of claim 23 wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and aluminum extraction of aluminum has a silicon/aluminum atomic ratio of at least 180.

25. **(Currently Amended)** The process of claim 23 wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and aluminum extraction of aluminum has a silicon/aluminum atomic ratio of at least 300.

26. **(Currently Amended)** A process for producing an olefin cracking catalyst comprising:

providing an MFI type catalyst containing aluminum and silicon in a crystalline silicate framework to provide an initial silicon/aluminum atomic ratio;

formulating said crystalline silicate catalyst with a silica binder to produce a formulated catalyst containing said MFI type crystalline silicate and the silica binder;

subsequent to the formation of said formulated MFI type crystalline silicate catalyst, subjecting said catalyst to steaming to remove aluminum from the crystalline silicate framework of the catalyst;

thereafter dealuminating said catalyst by treating said catalyst with a complexing agent to remove aluminum by extraction from pores of said catalyst deposited therein during the steaming

step, thereby providing a silicon/aluminum atomic ratio greater than said initial silicon/aluminum atomic ratio;

calcining said catalyst particles at an elevated temperature; and

wherein said MFI type crystalline silicate catalyst is a catalyst of the ZSM-5 type having an orthorhombic structure which prior to the steaming and extracting procedure, had a silicon/aluminum atomic ratio of less than 80 after steaming and extracting has a silicon/aluminum atomic ratio of more than 120.

27. **(Currently Amended)** The process of claim ~~23~~26 wherein said MFI type crystalline silicate is a ~~catalyst of the silicalite type catalyst~~, which prior to the steaming and extraction had a silicon/aluminum atomic ratio of at least 120.

28. **(Currently Amended)** The process of claim 27 wherein said MFI type crystalline silicate catalyst after at the conclusion of the extraction of aluminum extraction and steaming has a monoclinic structure symmetry.

29. **(New)** The process of claim 19 wherein the catalyst is calcined after dealumination at a temperature of from 400°C to 800°C at atmospheric pressure for from 1 to 10 hours.

30. **(New)** The process of claim 19 further comprising crushing the catalyst to a particle size of from 35 to 45 mesh.

31. **(New)** The process of claim 19 wherein the heating in steam is carried out at a temperature of from 425°C to 870°C at a water partial pressure of from 13 kPa to 200 kPa.

32. **(New)** The process of claim 19 wherein the heating in steam is carried out for a period of from 1 to 200 hours.

33. (New) The process of claim 23 wherein the heating in steam is carried out at a temperature of from 425°C to 870°C at a water partial pressure of from 13 kPa to 200 kPa.

34. (New) The process of claim 23 wherein the heating in steam is carried out for a period of from 1 to 200 hours.

35. (New) The process of claim 23 wherein the olefins are comprised of hydrocarbon feedstocks from a refinery.

36. (New) The process of claim 23 wherein the olefins are comprised of feedstocks from a steam cracking unit.

37. (New) The process of claim 23 wherein said feedstocks comprise a C₄ cut from a fluidized-bed catalytic cracking (FCC) unit.

38. (New) The process of claim 23 wherein the catalyst is used at process conditions comprising an inlet temperature of from 500°C to 600°C, an olefin partial pressure of from 0.1 to 2 bars, and an LHSV of 10 to 30 h.⁻¹.

39. (New) The process of claim 26 wherein the catalyst prior to the steaming and extracting step, had a silicon/aluminum atomic ratio of less than 80.

40. (New) The process of claim 28 where the crystallite size of the monoclinic crystalline silicate is 1 micron or less.

41. (New) The process of claim 38 yielding an olefinic effluent having at least 40% of an olefin content present as C₂ to C₃ olefins.

42. (New) The process of claim 37 wherein said C₄ cut comprises about 50 wt% olefin.

43. (New) The process of claim 23 wherein the olefins are comprised of a C₄ cut from a unit within a refinery for producing methyl tert-butyl ether (MTBE).

44. (New) The process of claim 23 wherein the olefins comprise a C₄ cut from a naphtha steam-cracking unit of a petrochemical plant where naphtha comprising C₅ to C₉ species have a boiling point range of from about 15°C to 180°C and are steam cracked to produce a C₄ cut.

45. (New) The process of claim 44 where said C₄ cut comprises from 40% to 50% 1,3-butadiene, about 25% isobutylene, about 15% butene, and about 10% n-butane and/or isobutene by weight.

46. (New) The process of claim 23 wherein the olefins comprise a C₄ cut from a steam cracking unit after butadiene extraction or after butadiene hydrogenation.

47. (New) The process of claim 23 wherein the olefins comprise light cracked naphtha (LCN).

48. (New) The process of claim 23 wherein the olefins comprise a medium cracked naphtha from a FCC unit

49. (New) The process of claim 23 wherein the olefins comprise visbroken naphtha obtained from a visbreaking unit that treats residue from a vacuum distillation unit in an oil refinery.

50. (New) The process of claim 23 where the catalyst is used to remove C₅ species from gasoline produced by an oil refinery.

51. (New) The process of claim 23 where the feedstock comprises from 10 to 100 wt% olefins